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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WANG, JIN CHENG	
ART UNIT	**PAPER NUMBER**
2672	

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/342,917	SUGIURA, HIROAKI	
	Examiner	Art Unit	
	Jin-Cheng Wang	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6,11 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6,11 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/22/2004*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's arguments, see Page 4, lines 18-19 of Remarks, filed Feb. 28, 2005, with respect to the rejection(s)of claim(s) 1 under 103(a) rejection over Komaki U.S. Patent No. 5,883,821 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Schwartz U.S. Patent No. 5,644,509.

Applicant's submission filed on Feb. 28, 2005 has been entered. Claims 1, 3-6, and 11-12 are pending in the present application.

Response to Arguments

Applicant's arguments filed Feb. 28, 2005 have been fully considered but they are not persuasive. As addressed below, Komaki teaches the claim limitations. In response to applicant's argument that the cited portions of Komaki disclose no integer computation, however, Komaki discloses the interpolation formula in col. 9-10 requires the integer computation in which the arithmetic expression has a multiplication between integers and a division by an integer divisor (*see* column 9-10 and 13; Figs. 11-37). Komaki discloses a constant having a large value greater than a value corresponding to a maximum interval of the grids (e.g., a constant value of power of 2 is a large value greater than a value corresponding to a maximum interval of the grids; *see* col. 9. line 61 to col. 11, line 14 and col. 13). Although Komaki does not specifically teach the claim limitation of "grids arranged at non-uniform intervals", Schwartz teaches the claim limitation of "grids arranged at non-uniform intervals" used to create the look-up table for the non-uniform

output grid to produce the non-uniformity and create a spacing that increases as the distance from the point of interest increases and thereby the accuracy is three times greater in the region of interest for a non-uniform grid than a uniform grid in a three-dimensional color space (see Schwartz Figs. 6, 9-10 and column 3-5). According to the combined teaching of Komaki and Schwartz, it would have been obvious to incorporate a non-uniform grid in a color look-up table. Doing so would enable the accuracy three times greater in the region of interest for a non-uniform grid than a uniform grid in a three-dimensional color space (see Schwartz Figs. 6, 9-10 and column 3-5).

Applicant argues that 2^n as used in Komaki cannot be a large value greater than a value corresponding to a maximum interval of the grids. It is first noted that the weights of Komaki involves some integers. Komaki also teaches the weights $1 - (dy+dz)/2^n$ are calculated by an addition between integers $0 < dy, dz < 2^n$ and division by the integer 2^n (col. 9-11 and 13; Figs. 4-37) and the weight values multiplied by a constant such as 2^n becomes $2^{n} - dy - dz$ and then using the constant as a divisor during an interpolation process in the formula in Column 10 of Komaki wherein 2^n is used as a divisor during the interpolation process.

Moreover, what is a maximum interval of the grids? A value corresponding to a maximum interval of the grids could be just a value of the function of n at a particular n because the maximum interval of the grids is n and the function of n. For example a function of n may be in the form of a multiple of n such as n, 2n, 3n, etc. or division of n such as 1/n, 2/n, 3/n, etc. What value corresponding to the maximum interval of the grids is not identified and therefore cannot be determined as set forth in the claim 1, 6, 11 and 12.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3-6, and 11-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. A value corresponding to a maximum interval of the grids could be just a value of the function of n at a particular n because the maximum interval of the grids is n and the function of n. For example a function of n may be in the form of a multiple of n such as n, 2n, 3n, etc. or division of n such as 1/n, 2/n, 3/n, etc. What value corresponding to the maximum interval of the grids is not identified and therefore cannot be determined as set forth in the claim 1, 6, 11 and 12.

Claims 3-5 are rejected because they do not correct the dependency on claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-6 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komaki U.S. Patent No. 5,883,821 (hereinafter Komaki) in view of Schwartz U.S. Patent No. 5,644,509 (hereinafter Schwartz).

Re claim 1, Komaki teaches a data conversion method of performing image processing on image data expressed in plural components by using a multi-dimensional look-up table (LUT) and outputting processed image data comprising the steps of setting grid positions (*selecting the grid positions*) of the multi-dimensional look-up table, obtaining output data of grid points of the multi-dimensional look-up table which corresponds to the input image data (*col. 1, lines 61-67*), generating a weight table to store weight values corresponding to the plural components based on the set grid positions wherein the weight values are calculated by an integer computation (*e.g., 1 – (dy+dz)/2^n are calculated by an addition between integers 0 < dy, dz < 2^n and division by the integer 2^n; see col. 9-11 and 13; Figs. 4-37*), and are multiplied by a constant which is a large value greater than a value corresponding to a maximum interval of the grids (*a constant of power of 2 such as 2^n is a large value greater than a value corresponding to a maximum interval of grids; see col. 9-11 and 13*), obtaining the weight values corresponding to the plural components of input image data by referring to the weight table (*col. 9-11 and 13*), calculating the processed image data which corresponds to the input image data by interpolation using the obtained output data, the obtained weight values and the constant (*col. 2, lines 10-30; col. 9-11 and 13*).

In other words, Komaki teaches data transformation corresponds to data conversion as claimed. Data conversion is converting one data into another and data transformation is converting data too. Furthermore, Komaki transforms output data for a point from a sample point such as a grid point in a three dimensional look-up table (LUT). He teaches the input signals R, G, B is interpolated and the values are stored in the look-up table (LUT). In addition,

*Komaki transform output data for a point from a sample point such as a grid point in a three dimensional look-up table (LUT). Also, a function must be determined for the purpose of converting pixel color representations into known quantities of colored printer inks, typically with the amount expressed as an integer in the range of 0 to 255 for each of cyan, magenta, yellow, and black. The function accepts input values for the variables red, green, and blue, and produces output values which represent quantities of cyan, magenta, yellow, and black. Other color spaces in use as either input or output spaces include the colorimetric spaces which represent color based on the tristimulus values that represent a standard observer as defined by the Commission Internationale de I'Eclairage. CIE L*a*b* CIE L*u*v* and CIE XYZ are three spaces. In addition, Komaki discloses grids arranged at non-uniform intervals and a constant such as 2^n which is a large value greater than a value corresponding to a maximum interval (n) of the grids (col. 9. line 61 to col. 11, line 14). The interpolation to be performed becomes an eight point interpolation using eight grid point data when k is eight and the interpolation space becomes cubic. The interpolation to be performed becomes a five point interpolation using five grid point data when k is five. The shape of the solid body to express the interpolation space is then variable depending upon selection of the five grid points.*

Komaki does not specifically teach the claim limitation of "the interpolation is executed by an integer computation and uses the constant as a divisor".

However, Komaki suggests the claim limitation of "the interpolation is executed by an integer computation and uses the constant as a divisor" in col. 2, lines 10-30 and col. 9-11 and 13 wherein a constant of power of 2 such as 2^n has been used as a divisor in the interpolation

formula and the interpolation has employed subtraction, addition and division among some integers (*see also* col. 9-11 and 13).

Therefore, according to the teaching of Komaki, it would have been obvious to incorporate a divisor and integer computation in the interpolation. Doing so would enable accuracy and efficiency without sacrificing speed or error performance.

Komaki does not specifically teach the claim limitation of "grids arranged at non-uniform intervals".

However, Schwartz teaches the claim limitation of "grids arranged at non-uniform intervals" used to create the look-up table for the non-uniform output grid to produce the non-uniformity and create a spacing that increases as the distance from the point of interest increases and thereby the accuracy is three times greater in the region of interest for a non-uniform grid than a uniform grid in a three-dimensional color space (see Schwartz Figs. 6, 9-10 and column 3-5).

According to the combined teaching of Komaki and Schwartz, it would have been obvious to incorporate a non-uniform grid in a color look-up table. Doing so would enable the accuracy three times greater in the region of interest for a non-uniform grid than a uniform grid in a three-dimensional color space (see Schwartz Figs. 6, 9-10 and column 3-5).

Re claim 3, Komaki discloses the value of the constant is a power of 2 (col. 10 and 13). In other words, Komaki teaches a power of 2 as a divisor.

Re claim 4, Komaki discloses grid points are set in non-uniformity and the grid positions corresponding to each of the components are set the same (Fig. 2-3). In figure 2 and 3, Komaki

discloses the grid points are equal to each other and he performs interpolation by dividing interpolation grid into equal size thus each position are the same.

Re claim 5, Komaki discloses input value is image data in one of RGB, CMY, and XYZ color spaces (col. 1. lines 17-36 and 51-67; col. 9, lines 1-34). In other words, Komaki teaches input luminance signals RGB.

Re claim 6, the limitation of claim 6 is identical to claim 1 above. Therefore, claim 6 is treated with respect to grounds as set forth for claim 1 above.

Re claim 11, the limitation of claim 11 is identical to claim 1 above except for a computer program product comprising a computer readable medium having a computer program code. Therefore, claim 11 is treated with respect to grounds as set forth for claim 1 above except for a computer program product comprising a computer readable medium having a computer program code.

As for a computer program product comprising a computer readable medium having a computer program code, Komaki teaches a program readable by a computer (col. 4, lines 57-59). When a computer has program then executes to allow the coding to program the system.

Re claim 12, the limitation of claim 12 is identical to claim 1 above except for a computer readable medium recorded data. Therefore, claim 12 is treated with respect to grounds as set forth for claim 1 above except for a computer readable medium recorded data. As for a computer readable medium recorded data, Komaki teaches a storage medium storing a program readable by a computer (col. 4. lines 57-59). A program readable by a computer corresponds to a computer readable medium recorded data. A recorded data is a stored data.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (571) 272-7665. The examiner can normally be reached on 8:00 - 6:30 (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (571) 272-7664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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